

WE CLAIM

1. A telecommunications system for connecting to a network and for routing data messages between the network and subscriber terminals of the telecommunications system, the subscriber terminals being connectable to a central terminal of the telecommunications system via a transmission medium, the telecommunications system providing a number of communication channels arranged to utilise the transmission medium for transmission of data between the central terminal and the subscriber terminals, the telecommunications system comprising:
 - 5 a transmitter within the central terminal for sending a data message destined for a particular subscriber terminal over at least one of the communication channels as a number of data blocks; and
 - 10 a frame generator within the central terminal for generating a number of frames to represent each data block, each frame having a header portion and a data portion, the header portion being arranged to be transmitted in a fixed format chosen to facilitate reception of the header portion by each subscriber terminal and being arranged to include a number of control fields for providing information about the data portion, the data portion being arranged to be transmitted in a variable format selected based on predetermined criteria relevant to the particular subscriber terminal to which the data portion is destined.
- 15 2. A telecommunications system as claimed in Claim 1, wherein the predetermined criteria comprises an indication of the signal-to-noise ratio (SNR) of signals received by the destination subscriber terminal from the central terminal.
- 20 3. A telecommunications system as claimed in Claim 2, wherein if there are a plurality of formats selectable as the variable format given the indicated signal-to-noise ratio and the amount of data to be sent in the data block, then the frame generator is arranged to select from those plurality of formats the format requiring lowest transmission power.

4. A telecommunications system as claimed in Claim 1, wherein the variable format is defined by a number of parameters, a first parameter being a channel coding to be applied to the data in the corresponding data portion.

5. A telecommunications system as claimed in Claim 4, wherein a second parameter is a modulation type to be applied to the data in the corresponding data portion.

6. A telecommunications system as claimed in Claim 5, wherein a third parameter is a symbol rate for the data in the corresponding data portion.

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7. A telecommunications system as claimed in Claim 4, wherein the parameters defining the variable format used for the data portion are identified in one or more control fields of the corresponding header portion.

8. A telecommunications system as claimed in Claim 1, wherein the fixed format used for the header portion employs a relatively low symbol rate.

9. A telecommunications system as claimed in Claim 1, wherein the fixed format used for the header portion employs no channel coding.

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10. A telecommunications system as claimed in Claim 1, wherein each subscriber terminal comprises a first number of channel monitors to enable each of the communication channels to be monitored, whereby each subscriber terminal can read the header portion of each frame irrespective of which communication channel that frame is transmitted on.

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11. A telecommunications system as claimed in Claim 10, wherein the header portion includes an identification field identifying the subscriber terminal for which the corresponding data portion of the frame is destined, each subscriber terminal comprising a second number of processors for processing data portions destined for that subscriber terminal based on information about the variable format identified in the control fields of

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the corresponding header portion, and the channel monitors being arranged to identify to the processors those frames containing data portions destined for that subscriber terminal.

12. A telecommunications system as claimed in Claim 11, wherein the second
5 number of processors is less than the first number of channel monitors, whereby at any point in time the header portions of the frames on each of the communication channels can be read, but only the second number of data portions can be processed by a particular subscriber terminal.
- 10 13. A telecommunications system as claimed in Claim 1, wherein the frame generator is also provided in at least one of the subscriber terminals to enable frames to be generated for data blocks to be transmitted from the subscriber terminal to the central terminal, the subscriber terminal being arranged to issue to the central terminal over the transmission medium a request signal when it has data to send to the central terminal, the
15 central terminal being responsive to the request signal to grant access to the subscriber terminal on a communication channel selected by the central terminal.
14. A telecommunications system as claimed in Claim 13, wherein the central terminal is arranged to grant access by including in a control field of a frame issued by
20 the central terminal on the selected communication channel a grant signal identifying the subscriber terminal.
15. A telecommunications system as claimed in Claim 14, wherein the grant signal grants the subscriber terminal access to the selected communication channel to send one
25 frame, the subscriber terminal being arranged to continue asserting the request signal until a grant signal has been received for the final frame that the subscriber terminal has to send.
16. A telecommunications system as claimed in Claim 1, wherein the header portion
30 includes a power control field for identifying a power control signal to be used by the recipient of the frame to control the power of signals subsequently issued by that recipient.

17. A telecommunications system as claimed in Claim 1, wherein the header portion includes a code synchronisation control field for identifying a code synchronisation signal to be used by the recipient of the frame to control the code synchronisation of signals subsequently issued by that recipient.

18. A telecommunications system as claimed in Claim 1, wherein the header portion includes a field containing a predetermined training sequence used by the recipient of the frame to determine the phase of a carrier signal.

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19. A telecommunications system as claimed in Claim 1, wherein the transmission medium is a radio resource facilitating wireless communications between the central terminal and the subscriber terminals.

20. A telecommunications system as claimed in Claim 1, wherein the communication channels are orthogonal channels defined using CDMA.

21. A method of operating a telecommunications system to route data messages between a network and subscriber terminals of the telecommunications system, the subscriber terminals being connectable to a central terminal of the telecommunications system via a transmission medium, the telecommunications system providing a number of communication channels arranged to utilise the transmission medium for transmission of data between the central terminal and the subscriber terminals, the method comprising the steps of:

transmitting a data message destined for a particular subscriber terminal from the central terminal over at least one of the communication channels as a number of data blocks; and

generating a number of frames to represent each data block to be transmitted, each frame having a header portion and a data portion, the header portion being arranged to be transmitted in a fixed format chosen to facilitate reception of the header portion by each subscriber terminal and being arranged to include a number of control fields for providing information about the data portion, the data portion being arranged to be

transmitted in a variable format selected based on predetermined criteria relevant to the particular subscriber terminal to which the data portion is destined.

22. A computer program operable to configure a telecommunications system to perform a method as claimed in Claim 21.

23. A carrier medium comprising a computer program as claimed in Claim 22.

24. A frame generator for a telecommunications system as claimed in Claim 1, the frame generator being arranged to generate a number of frames to represent a data block to be transmitted over the transmission medium, each frame having a header portion and a data portion, the header portion being arranged to be transmitted in a fixed format chosen to facilitate reception of the header portion by each subscriber terminal and being arranged to include a number of control fields for providing information about the data portion, the data portion being arranged to be transmitted in a variable format selected based on predetermined criteria relevant to the particular subscriber terminal to which the data portion is destined.

25. A transmission signal comprising at least one frame, the frame having a header portion and a data portion, the header portion being arranged to be transmitted in a fixed format chosen to facilitate reception of the header portion by a plurality of receivers and being arranged to include a number of control fields for providing information about the data portion, the data portion being arranged to be transmitted in a variable format selected based on predetermined criteria relevant to a particular receiver to which the data portion is destined.

26. A transmission medium arranged to carry a transmission signal as claimed in Claim 25.